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1991 PROFESSIONAL SEMINAR OVERVIEW

Under the theme *Beliefs in Action: Creating Realities for the '90s*, forty-six members of the Professional Division gathered on July 20th at The Monroe Institute Center for the ninth annual Professional Seminar. Excitement ran high as the weeklong program convened, drawing members from across the United States, Canada, England, and Switzerland. The increasing quality of the work done in the Professional Division and the strong commitment of its members were evident in the excellence of the feature presentations. Topics addressed the latest innovations in Hemi-Sync research and application in the fields of psychophysiology, education, animal environments, psychotherapy, the military, mathematics, and healthcare. Topic papers submitted by feature presenters appear below.

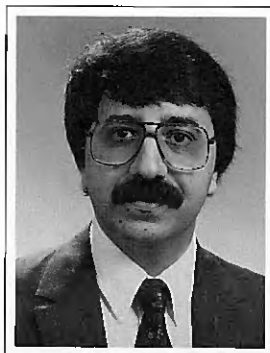
Open forum and project review sessions provided interesting updates on work in progress, such as the "Hemi-Sync Book project" headed by Russ Russell, MA, of Cambridge, England. Articles and papers on the Hemi-Sync technology have been received during the past months by Mr. Russell, who projected that, with the additional material pledged at the seminar, manuscript editing can now be completed. Prompted by Bob Monroe's challenge during his Saturday evening welcome, Chok Hiew, PhD, chaired a meeting on funding procurement for independent Hemi-Sync projects and publication in refereed journals. Rita Black introduced "The First Step," a Hemi-Sync pilot program she developed to support cancer patients' wellness. Following up on the Teen Tapes project [see *HEMI-SYNC JOURNAL*, Fall 1990, Vol. VIII, No. 4], Bob Sornson, EdS, led a discussion to consider publishing the Teen Tapes and creating specialized Hemi-Sync programs for children. Larry Lambertson, MD, provided an overview of free energy research; ChowChow Imamoto, RN, reviewed her work with clients using the *Stroke Recovery Series*; and Marian Moore, MA, described her experience of natural healing. A guest presentation on vital force harmonics was offered by Sherry Edwards, and Dave Wallis, systems test engineer, reported on the current status of TMI hardware research and development.

As a counterpoint to the technical and educational sessions, participants also enjoyed opportunities for deep inner work throughout the week. Bernice Hill, PhD, and Ed Wilson, MD, facilitated a powerful four-hour mini-workshop using holotropic breathwork developed by Stanislov Grof, combined with selected Hemi-Sync sequences. Suzanne Morris, PhD, and Bob Sornson led the group in a guided exercise to communicate intuitively with children who have special problems and disabilities. Phil Shaffer administered the Myers-Briggs Type Indicator test, designed to identify temperament styles, and provided an analysis of the seminar group's scores. (For those who are familiar with the MBTI, the INFP type represented two-thirds of the group.) Individual, monitored sessions in the laboratory isolation booth offered customized Hemi-Sync experiences, and a daylong Hemi-Sync intensive introduced participants to state-of-the-technology frequency patterns and new exercises from the *LIFELINE* program.

During a highlight of the week's social activities, participants were warmly welcomed into the home of Nancy and Bob Monroe for the annual Professional Seminar open house. The closing festivities included an exciting, high-energy performance by Washington, D.C., musicians Julia Nixon and David Ylvisaker, whose concert was a gift to the program and an appropriate conclusion to what everyone agreed was the best Professional Seminar yet.



THE MYSTERIES OF HEMI-SYNC: BEYOND BRAIN ENTRAINMENT



by Mohammad R. Sadigh, PhD

Mohammad Sadigh is director of psychology and psychophysiological services at The Gateway Institute, a center for pain and stress management in Bethlehem, Pennsylvania. He practices psychotherapy and biofeedback and is in charge of the center's neuropsychological laboratory. Computer-assisted brain mapping is his primary area of research. Here, Dr. Sadigh highlights the results of his ongoing independent research with Hemi-Sync.

The phenomenon of bilateral hemispheric synchronization first appeared in studies of advanced meditators approximately thirty years ago. Transcendental meditators, especially, appeared to be able to achieve cortical synchrony after years of practice. However, the frequency at which such synchrony took place was beyond the control of the meditator. Most meditators tend to achieve bilateral synchrony only within a certain uncontrollable frequency range (usually low alpha).

Theoretically, when the two hemispheres function in unison and in synchrony a variety of beneficial effects, both physical and psychological, may ensue. That is why, during the past several years, a number of researchers, clinicians, and entrepreneurs have attempted to develop ways of inducing whole-brain synchrony. Since transcendental meditation takes quite some time to accomplish, and there are no guarantees that it will work, and because the meditation effect appears to be limited to a specific frequency band, more and more people are trying to combine the new and old technologies to attain hemispheric synchrony.

After experimenting with a wide variety of technologies, ranging from visual to audio to transcranial electrical stimulation, I came to believe that perhaps TM was the only way of inducing full-brain synchrony because the only synchronized brain I had seen was that of an adept meditator.

After attending the *GATEWAY VOYAGE 1* began to conduct a series of studies to determine if Hemi-Sync was an effective way of achieving hemispheric synchrony. The first Focus 10 study, conducted at The Gateway Institute's neuropsychological laboratory, provided me with the initial proof that Hemi-Sync does work. Hemi-Sync entrained the brain of a subject to achieve and maintain a full state of hemispheric synchrony within the theta range. Research shows that as meditation subjects move toward the theta stage, they tend to either fall asleep or rapidly move toward higher frequencies. The Hemi-Sync signal appears to help overcome such tendencies.

During the second and third studies, a subject listened to Focus 12 tapes. The results of both studies showed significant bilateral synchronization in the beta range. Also, at the end of the third study, and at the end of the Hemi-Sync introduction, the subject was asked

to "open the Access Channel," a specific command used in the *HUMAN PLUS* tape series, and which prepares the listener to learn new cognitive tasks. For the first time, I witnessed a nonmeditator achieving whole-brain synchrony without the use of a tape or the Hemi-Sync frequencies. This was most important. It suggested that perhaps, after exposure to the signal for a period of time, the subject may be capable of reentering a variety of states of consciousness without the use of any external cues or technologies.

During this past year, I have conducted a number of new studies with Hemi-Sync. I was especially interested in documenting subjects' abilities to summon the effects of Hemi-Sync without listening to tapes.

The most significant and impressive studies conducted in our laboratory were those in which the subject was listening to Focus 12 tapes. As mentioned, shortly after listening to these tapes the subject's brain-wave activity showed signs of synchrony in the beta range. To discover if he could enter the same state without the aid of the tapes, a more complex single subject design (ABAB'A) was used. I combined three baseline phases (A) with two treatment conditions (B and B'). During the initial baseline, the subject's EEG was recorded. The subject was then asked to meditate using his own technique. A second baseline was established; then the subject was asked to count from one to twelve and stay in Focus 12 (B'). A final baseline was established after this phase was completed. The subject's baseline recordings showed asynchronous activities across the cortex. During the meditation phase (B), an increase in high alpha and beta activities was noted. However, there were no signs of hemispheric synchronization. Shortly after the subject entered the second treatment phase (B'), that is, self-induced Focus 12, there were clear indications of whole-brain synchrony.

Therefore, at this stage, one may suggest the tentative hypothesis that it is possible to summon the beneficial and perhaps extraordinary effects of Hemi-Sync at will. To achieve this, one needs some exposure to the Hemi-Sync signal and perhaps needs to learn certain verbal cues.

In several other studies, using the *HUMAN PLUS* Access Channel command, it was established that subjects who had exposure to *H-PLUS* tapes were able to synchronize their brains by merely counting from one to eleven and quietly saying the words: "Access Channel open." Thus far, a total of four *H-PLUS* studies have been conducted. The first study showed full beta synchrony at Focus 11, the Access Channel. The second and third studies showed synchronous alpha activities, while the most recent study in this series showed synchronized theta across the cortex. Again it was objectively demonstrated that one need not become dependent on these tapes to benefit from them.

Hemi-Sync and Autogenic Training

A research and/or clinical tool, no matter how impressive, has limited value unless it can be integrated and combined with other tools and techniques. Can Hemi-Sync meet this criterion?

Autogenic training (AT) is one of the oldest Western approaches to psychophysiological reconditioning and is considered one of the most effective relaxation techniques, with a sound and well-established theory. The term "autogenic" is derived from Latin *autos* (from within) and *genos* (generated and developed). AT helps bring about positive and therapeutic changes that are generated from within. Hundreds of published studies have investigated the effectiveness of this technique in treating a variety of psychosomatic and stress-related disorders.

... Hemi-Sync appears to be the most effective approach, as well as being one of the safest, accomplishing what it claims to do.

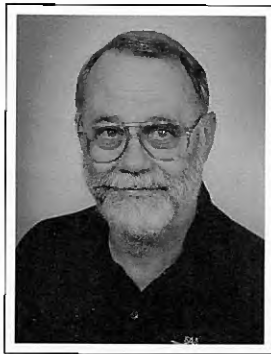
Studies of the effects of AT on cortical activity have shown that after prolonged practice (a minimum of six months) there is a tendency toward hemispheric synchronization, similar to that seen in experienced meditators. During the past several years, I have modified and expanded the standard autogenic exercises for our clinical purposes at The Gateway Institute. Last year, I began studying the combined effects of AT and Hemi-Sync by adding some theta to the background of these tapes. Two patients who had listened to these tapes for approximately six weeks underwent EEG testing. Again a simple ABA reversal design was used for these studies. During the baseline phase (A) subjects were asked to simply rest in a recliner. They were then asked to repeat two autogenic phrases for approximately one minute. A final posttreatment baseline was established after this phase. In both cases, subjects' EEG activities moved from asynchrony to full synchrony. One subject's EEG showed synchrony in theta, while the other showed synchrony in alpha. Again it was documented that after exposure to Hemi-Sync one can induce synchrony at will once certain verbal associations and cues are established (i.e., autogenic phrases).

Conclusions

The phenomenon of hemispheric synchronization has been attracting the attention of researchers and clinicians for some time. Of various technologies and procedures which purport to induce bilateral synchrony, Hemi-Sync appears to be the most effective approach, as well as being one of the safest, accomplishing what it claims to do. However, many questions concerning Hemi-Sync remain unanswered. Without a doubt, only well-designed research studies will assist us in unveiling the mysteries of Hemi-Sync.



HEMI-SYNC: RECOVERING THE ATTRACTORS



by Glenn Pearce

Glenn Pearce, professor of philosophy, completed undergraduate work at William and Mary and graduate studies at Duke University. He has been a member of the faculty of the University of Western Ontario for twenty-four years and served as chairman of the philosophy department. His main interests are cognitive science and metaphysics. This presentation discusses preliminary results from the application of chaos theory mathematics to Hemi-Sync and brain-wave frequencies.

My research on the encephalography of conscious states has three main goals:

1. Since the EEG data I am studying pertain to subjects exposed to Hemi-Sync signals, there is some chance of providing feedback for the further development of Hemi-Sync technology.

2. By studying the cerebral activity underlying conscious states, one may hope to gain insight into the laws governing cognitive phenomena. Of course, what we can discover in this way depends crucially on the nature of the relation between neural behavior and states of consciousness.

3. This brings me to my long-range interest, which is philosophical, namely: to increase our basic understanding of the mind-brain relation itself. As noted by Henri Bergson almost a century ago, this relation has been *studied* very little. There are many theories, to be sure, but not much in the way of *testable* hypotheses. Thus, contrary to tradition, the study of human EEG records seems a very natural way to address this perennial question. Before describing my current work, a brief summary of the chaos-theoretic approach involved will be useful.

The behavior of a dynamic system may be represented in *phase space*, a multidimensional mathematical space with one dimension for each variable needed to describe the system. Each point in this space represents a possible state ("phase") of the system; a *trajectory* through this space represents the possible behavior of the system over time; and an *attractor* for the system exists when nearby trajectories are drawn into a given one. For example, a pendulum is representable in two dimensions, for *position* and *momentum*. If it is free-swinging (so that it slows down and stops due to friction) its "phase portrait" spirals in to the central fixed point, which is its attractor. If it has a regular period (as when driven by a motor) then its phase portrait coincides with the attractor, which is a closed loop.

A system is *chaotic* when the dimension of its phase space is *fractal* (fractional); its attractor is said to be *strange*. Strange attractors never cross themselves or repeat—that would mean a periodic system—yet the behavior they describe is nonrandom. (By contrast, the portrait of truly random activity would visit every point in an infinite dimensional space.) Many strange attractors have become familiar; one of the best known is the attractor for the Lorenz weather model. [Ed.: For more background information on chaos theory, see *HEMI-SYNC JOURNAL*, Fall 1990, Vol. VIII, No. 4.]

One can computer-generate a system's attractor from its governing equations, if they are known. If not, we must somehow reconstruct the attractor for the system's behavior. The application of chaos theory to natural systems has been greatly advanced in the last decade by the development of accurate and reliable reconstruction methods, using time-series data from a *single* variable of the system. One such—the method of delays—is used in my current work, to which I now turn.

The investigation is motivated by the following questions: Are there neural attractors characteristic of specific cognitive processes or conscious states (e.g., TMI focus levels)? Are any (such) attractors correlated with specific Hemi-Sync signals? What implications would affirmative answers have for the prospect of controlled access to specific conscious states, and for the development of Hemi-Sync-related technologies?

I began to address these questions in February of 1991, when I was able to spend a week in the TMI lab, examining files from the NRS-24 brain mapping system. Subsequently, I have been constructing and studying two-dimensional phase portraits from EEG data on three subjects: RO (a sleep study); WR (a *GATEWAY* learning protocol study); and DM (unknown stimulus; short files used only for comparison). The same techniques were also applied to Hemi-Sync signals passed through the NRS-24 system without the intervention of a human brain.

Initially, it was unclear how to select from the enormous database available. However, since my first task was to master techniques new to me, it seemed reasonable to search for "typical" epochs, i.e., those which resemble averaged data. Following are a few of the preliminary results which have emerged, along with some highly tentative commentary.

There is a generic shape similarity among all the phase portraits from a given subject, regardless of stimulus differences, though there are many variations within the general pattern. On the other hand,

there was general *dissimilarity* of portrait shape between subjects.

These two results suggest something like a neural handwriting or signature for each subject. (To confirm this conjecture would require a controlled multisubject study.) The existence of a *personal* signature need not preclude attractors characteristic of specific *cognitive states*; that depends on particular features of the attractors involved. This question is important in that animal studies have suggested that there are such characteristic attractors (underlying odor recognition, for example) which might be generically similar across subjects.

Different electrode sites were examined in the case of subject RO, than in that of subject WR. Could this difference account for the signature differences observed? Apparently not, since a large block of WR data is from the site where the WR signature is maintained. Indeed, if portrait shapes were site specific, one would not expect the similarities found between two sites of the RO data.

There were several examples of rather dramatic similarity between the portraits of two sites for the same epoch in the RO data (Figure 1). Since these sites are on opposite sides of the head, hemispheric synchronization is strongly suggested. This can be confirmed by superimposing the raw EEG records, noting the high degree of overlap (Figure 2).

Figure 1.

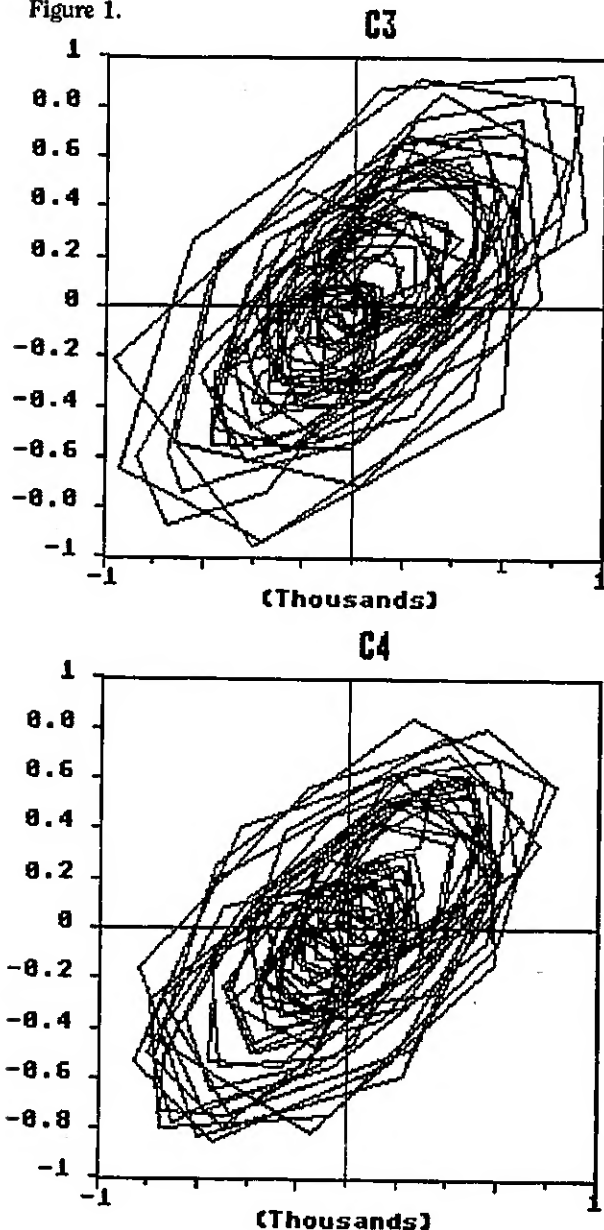
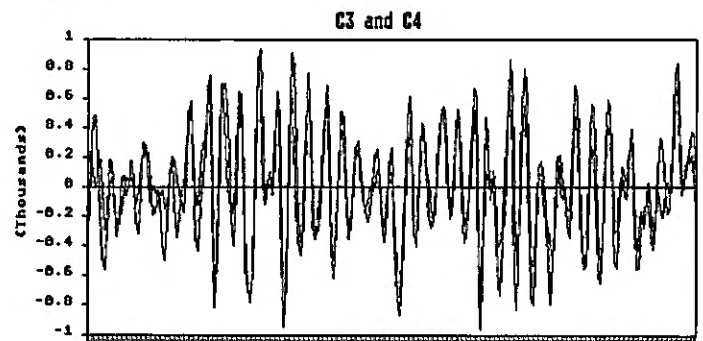


Figure 2.



Such apparent synchronization might have resulted from head-movement artifacts, which affect all sites similarly and are strong enough to swamp the normally weaker brain waves. However, this explanation is easily rejected by inspecting adjacent epochs.

Another possible explanation is that the apparent synchronization is due to entrainment. This would be exciting if true, since it is the basic presupposition of the Hemi-Sync technology. In order to test this hypothesis directly, one would need *simultaneous* EEG and Hemi-Sync stimulus records, making it possible to investigate real-time correlations. Unfortunately, this was not part of the brain mapping protocol. In any case, that explanation is ruled out for examples of synchrony in the RO file which occur in the baseline epochs, when there is no auditory stimulus at all.

Yet another hypothesis might be suggested. Hemispheric synchrony is known to be correlated with certain *relaxed* states, quite independently of external stimuli, as was amply demonstrated by the TMI research report of Mohammad Sadigh in 1990. [See *HEMI-SYNC JOURNAL*, Fall 1990, Vol. VIII, No. 4.] Perhaps subject RO is simply *adept* at reaching such states? There may well be some evidence for this, though it would have required the subject's permission to report it here. Whatever the explanation, it is noteworthy that the portraits in question bear an interesting resemblance to the Focus 15 Hemi-Sync signal pattern, which is certainly consistent with the correlation between hemispheric synchrony and relaxed states.

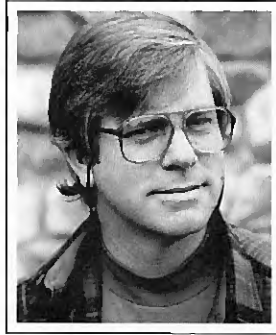
This interim report only scratches the surface. I look forward to working more closely with TMI lab personnel over the coming months, and to reporting more fully at the 1992 Professional Seminar.



SEMINAR SESSION TAPES AVAILABLE

You may purchase audio recordings of all presentations summarized in this issue except the session by James Greene, which relied heavily on visual aids. To place a credit card order, call (800) 541-2488, or send your check or money order to The Monroe Institute, Route 1, Box 175, Faber, VA 22938-9749. The cost is \$14.00 U.S. per tape, including shipping and handling (Virginia residents add 4.5% sales tax). Offer expires December 31, 1991. All orders will be shipped by January 15, 1992.

HEMI-SYNC AND THE SLEEP STATE



by F. Holmes Atwater

F. Holmes Atwater is coordinator of educational programs and TMI's Brainmapping Project. A retired military officer, he has been a college instructor, scientific investigator, and behavioral engineer, and has completed graduate work in counseling psychology. His specialty is in the design and application of techniques for cultivating propitious states of consciousness. Results of the laboratory evaluation of the Hemi-Sync Sleep Processor prototype are reported in this paper.

Background

The Monroe Institute's Natural Sleep Processor (NSP-1) is a solid state, microprocessor-based electronic device which produces Hemi-Sync sound patterns designed to induce natural sleep cycles. To evaluate the efficacy of this device, electroencephalographic (EEG) recordings of volunteers were taken before and while listening to the NSP-1 prototype. Over the years, sleep has been the subject of study with EEG recordings and, although meticulous measurements of the sleep process require monitoring of eye movement, facial muscles, and certain other parameters, EEG brain-wave patterns are still relied on as indicators of changes of consciousness associated with sleep.

Procedure and Method

After attaching surface electrodes at positions FP1, FP2, C3, and C4 (International 10/20 system) to volunteers' heads, they were connected to a computerized EEG recording device, the Lexicor Neurosearch-24, which provided EEG data acquisition, analysis, and display. Volunteers lay on a waterbed in an enclosed chamber isolated from distractions and the evaluators and their computer monitors. Volunteers were instructed to attend to sounds over a period of ninety minutes. These sounds were produced by the NSP-1 and heard through piezoelectric earphones. A series of EEG recordings was made according to the following protocol: 1. Five minutes of baseline recording before turning on the NSP-1; 2. Five minutes recording of the five minutes after turning on the NSP-1; 3. Five minutes recording at fifteen minutes after turning on the NSP-1; 4. Five minutes recording at twenty-five minutes after turning on the NSP-1; 5. Five minutes recording at forty minutes after turning on the NSP-1; and 6. Five minutes recording at sixty minutes after turning on the NSP-1. All EEG data was recorded and saved on an IBM compatible 386 AT in raw form accessible only by Lexicor's proprietary software and hardware.

Volunteers

The volunteer pool included adult males and females, aged twenty to sixty. None of the volunteers had clinically diagnosed sleep disorders.

Familiarity with Hemi-Sync ranged from naive to adept. Volunteers participated in evaluation trials both midmorning (approximately 10:00 AM) and midafternoon (approximately 2:00 PM).

Data Analysis

All data was screened for movement artifacts; those epochs demonstrating artifact levels were discarded from analysis. For each volunteer's data, each five-minute recording period was then subjected to a trend analysis of the EEG activity at sites C3 and C4 to determine the fluctuations of individual frequency bands of interest over time. The trend was computed by taking the fast Fourier transform (FFT) of a single epoch of data, then summing the values within the range of frequencies corresponding to each band. Percent average power (μV^2 pp) of delta (1-4Hz), theta (4-8Hz), alpha (8-12Hz), and beta (12-16Hz) was computed. The individual five-minute trends were then examined for archetypal epochs reflecting recognized patterns associated with different sleep states. When identified, these archetypal epochs were analyzed in raw form; the percent average power of each frequency band of interest was then quantified.

An ancillary spectral analysis was conducted to evaluate the extent of brain-wave frequency following response (FFR) to the binaural beat frequencies presented in the NSP-1 Hemi-Sync sounds. Five minutes average power at the C3 electrode was calculated for frequencies from 1 to 16 Hz for each of the five-minute recording periods and graphically plotted. Each of the five-minute averaged spectral plots, which represented different binaural beat stimuli from the NSP-1, were compared. Spectral plots for the archetypal epochs were also constructed and examined.

Results

Volunteers slept during the evaluation process. Trend analysis of each five-minute recording period in each volunteer's data confirmed standard EEG frequencies associated with sleep. Baseline recordings taken before turning on the NSP-1 consistently evidenced higher percent average power of alpha as compared with later recordings when volunteers were asleep and listening to the NSP-1. EEG brain-wave patterns reflecting different sleep states were easily identified.

The ancillary spectral analysis demonstrated evidence of a frequency following response to the binaural beat frequencies produced by the NSP-1.

Discussion

The rate of descent and degree of depth into the non-REM sleep stages varied from one individual to another. Also, the amount of time spent in the various sleep stages varied from one volunteer to another. A few of the volunteers awoke during the evaluation process, only to return quickly to sleep. When questioned, this group related that they had been awakened by soreness associated with electrode placement.

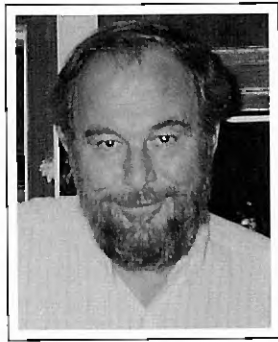
This NSP-1 evaluation used a natural ninety-minute nocturnal sleep cycle (the NSP-1 Hemi-Sync-produced environment) applied to volunteers during normal waking hours. The NSP-1 is programmed for nocturnal sleep patterns, not daytime naps. Evaluation volunteers, however, fell asleep when presented with this Hemi-Sync environment.

Summary

Careful laboratory evaluation of the NSP-1 cogently demonstrates that natural sleep can be induced during normal waking hours with specially engineered, sequentially presented sound patterns developed by The Monroe Institute. This finding supports the hypothesis that consistent use of the NSP-1 during nocturnal sleep fosters the production of natural sleep cycles.



A PSYCHOPHYSIOLOGICAL STUDY OF THE HEMI-SYNC PROCESS



by Edgar S. Wilson, MD

The following summary of this paper, co-authored with Teena Anderson of the TMI research laboratory, delineates the findings described in Ed Wilson's presentation. Dr. Wilson is a neurologist and former associate professor at the University of Tennessee Medical Units. Until this past year, he directed the pain management program at the Colorado Center for Biobehavioral Health. Since then, he has entered into full-time research in his favorite pastime—the EEG correlates of altered states of consciousness.

Are there significant changes in known physiological variables that occur with binaural beat auditory stimulation? Can Hemi-Sync enhance the induction of transcendent experience? A series of one male and three female adept subjects were studied and compared with one female and four male naive subjects while listening to the same sequential series of Hemi-Sync sounds. Naive subjects were retested after participating in the *GATEWAY VOYAGE* program at The Monroe Institute.

Method

Subjects were connected to a 24-channel computerized EEG with topographical display, the Lexicor Neurosearch-24, and a J & J physiograph measuring skin polarity, digital temperature, respiration, and galvanic skin response. Data was collected at 256 bits per second for ninety seconds at baseline (without sound), during stimulation with pink noise (no embedded frequencies), during each of four sequential beat frequency combinations (Focuses 10, 12, 15, and 21) embedded in pink noise, and during a silent postbase period. Subjective reports of experiential content were obtained during a debriefing period after each experimental condition, and at the end of the experiment. All data was collected while each subject lay prone on a waterbed, with eyes closed, head facing north in a sound- and light-proof chamber, between 10:00 AM and 3:00 PM. Subjects were instructed as to the content of the experiment and methods of data collection during the hookup procedure.

Data Analysis

All artifacts were screened for and discarded from the raw data. The raw data was scanned and computed to display color topograms. Events called "burst phenomena" were identified and subjected to time series and cascade analyses. Burst phenomena are high-amplitude peaks of short duration occurring at CZ, or the central zone electrode placed at the center of the top of the head. Physiographic data was correlated to EEG data. Averaged power/frequency in each experimental condition was compared with the combined auditory beat frequency signal recorded with the EEG data on an auxiliary channel of the EEG.

Results

The composite beat frequency signal began to correspond to activity at C-3, C-4 (electrodes positioned to the left and right of CZ), and CZ only at the beginning of burst phenomena in adept subjects. This correspondence began at delta and low theta frequencies during Focus 10 and Focus 12 auditory stimulation. These bursts corresponded to changes in time/space orientation and physiologic changes resembling early sleep. As Focus 12 signals progressed to Focus 15, marked splitting in the frequencies began to occur. Low delta and theta activity was maintained in the CZ area with a progressive drop in alpha behind the sylvian sulcus (back of the head). At the same time, burst phenomena began to spread over into the temporal lobe areas at T-4 (electrode above the right ear) and often T-3 (electrode above the left ear) as well. Marked correspondence between low-frequency bursts within the auditory cortex could be seen to amplify in power at CZ, followed by a progression to higher power and frequency activity in T-3 and T-4. These bursts were often accompanied by reported alterations in perceptions of body size and physical content of awareness. The altered perceptions frequently occurred during a reversal of skin polarity. As Focus 21 auditory frequencies were reached, further changes in EEG activity were often noted. Wave-like burst progressions ascended in frequency to as high as 128 Hz, with dominant power in these frequencies as well. This activity would almost exclusively reside in the temporal areas, with the rest of the cortex resembling sleep or very low power/frequency activity. Of the eight subjects exhibiting these phenomena, two showed activation of only the right temporal lobe. They seemed at a loss to remember the exact content of their experience. The five showing bilateral activation seemed to retain rather complete recall of being out-of-body and other psychical content of experience.

Hemi-Sync seems to provide a fairly predictable and non-value-laden process of inner discovery and transcendent experience.

The five subjects measured before and after the *GATEWAY VOYAGE* showed an interesting variability of response to the same series of stimuli. Before *GATEWAY*, initial power of burst activity was higher but frequency progression seemed lower than the adept group. Following the *GATEWAY VOYAGE*, three of the five subjects showed a pattern similar to adept subjects in EEG progression of power/frequency and topography. The other two seemed to have a reversal of effect. In pretest, one showed marked temporal activation and profound transcendent experience. Posttest revealed no temporal activation. When questioned about the change, he reported that his goals in the program were to ground his experience and to reduce the tendency to lose himself in spiritual pursuits or transpersonal experience. The other subject was a forty-seven-year-old lawyer who showed no shift in the pre- to post-*GATEWAY* series.

It is interesting that all shifts to high frequency/power activity in the temporal lobes occurred relative to feelings of thankfulness and delight in the experience rather than fear or cognitive analysis of the extraordinary experience. Both at pre- and posttesting, the alpha density at CZ of the two subjects who did not come to resemble adepts was much higher than the three who did. All subjects indicating OBEs and other psychical phenomena in this study tended to have a low alpha density and greater theta and delta power at baseline. This is in direct contrast to the "normal" population, where about eighty-five percent show high alpha activity at baseline with eyes closed. Diminishing high-frequency temporal lobe activity which occurred in the one subject was apparently a strong reflection of the power of will; the active desire to quit "spacing out" and to get busy manifesting his ideas and spiritual awareness in the more concrete ("real") world. The attorney was constantly caught up in an attempt to change his thoughts to more intuitive and feeling perspectives. His efforts at change seemed to block the spontaneity of experience.

Conclusion

Progressive binaural beat auditory stimulation seems to evoke predictable changes in EEG power, frequency, and topographic propagation in appropriately prepared subjects whose belief systems and will are congruent with the process and its purpose. EEG demonstrations of the Hemi-Sync signal can only be recognized occasionally at the beginnings of burst phenomena; however, there is a progression of this signal from low to high frequencies spreading from the auditory cortex to CZ, then to the temporal lobes. It has been demonstrated that the most reliable physiographic change that accompanies temporal lobe activation is reversal of skin polarity.

It is possible to separate the role played by the auditory stimulus from that of the group process, belief system, and will of the individual. Content of transcendent or transpersonal experience varied considerably as to detail but showed remarkable similarity in tone or experiential flow among all subjects tested. While experiential content tended to drift toward OBE and transpersonal psychical activity, there was a rather stereotyped progression of EEG activity common to all subjects having these experiences. These changes in EEG activity have also been noted in human natural healing studies, as well as psychical and channeling experiments, in which strong release of personal inhibition and expression of feeling was experienced. It is interesting that high-frequency temporal lobe activation seems to accompany transcendent experience regardless of the context, set and setting, or rationale given for the experience.

Hemi-Sync seems to provide a fairly predictable and non-value-laden process of inner discovery and transcendent experience. It may provide us with a predictable means of quantification of the effects of binaural beat technology on states of consciousness. Further studies in the signal penetration of binaural beat patterns on temporal lobe activation are anticipated.



HEMI-SYNC SOUNDS FOR SYNCHRONIZING BRAINS OF HORSES



by Helene N. Guttman, PhD

Helene Guttman has had a diverse education, with each advanced degree in a different field. She is now employed as the animal care coordinator in the Agricultural Research Service, USDA, and is active in varied metaphysical pursuits. Her extensive publications in biomedical areas include several on brain peptides that influence behavior. Here, Dr. Guttman discusses the results of her field experiments.

Background

Virtually all documented studies on the use of sound to modify behavior have been done using human subjects. These studies in-

clude a wealth of biomedical reports in the scientific literature and others published in magazines and books aimed at a more general audience. When working with human subjects, one usually gathers oral, subjective reports from the subject either during or after the experience. Sometimes it is useful to attach the subject to equipment that measures physiological reactions to determine whether subjective reports correlate with one or more physiological patterns.

Farmers in many countries reportedly play music in barns both to entertain the workers and to keep the animals happy and productive. Reports in the European scientific literature indicate that noxious noises (that people consider noise pollution) appear to have negative effects on animals: for example, reduction in milk production or increase in levels of the so-called stress hormones. There are no reports of controlled experiments attempting to correlate changes in patterns of animals' brain waves with the onset or cessation of sound stimuli.

Introduction to Our Study

The study described here was the first step in determining if animals other than humans respond to Hemi-Sync signals by synchronizing the electroencephalographic (EEG) output of the left and right sides of their brains. More specifically: Do horses (our chosen test species) respond to Hemi-Sync signals with brain synchronization, and if yes, can we visualize this phenomenon using inexpensive, noninvasive, portable (battery operated) equipment that would not interfere with an animal's normal habits and behavior?

To answer this question, we administered two types of prerecorded sounds to a horse: (1) a control tape that is devoid of Hemi-Sync sounds, and (2) an experimental tape that sounds like the control but has Hemi-Sync signals embedded under the control sounds. We selected as the control music that the subject horse appeared to like, based on our observations of his responses.

Planning Experiments: Some Precautions

Blinding the Investigator to the Type of Treatment Administered

It is important to eliminate the possibility that an investigator will expect a particular result, and thereby unconsciously influence the experiment to obtain those results. For example, in the now-classic report on maze learning in rats (Markowitz and Sorrells 1969), the experimenters divided a litter of inbred rats into two groups and told the investigator that one group was derived from a line of slow learners and the other from a line of fast learners. The result was that rats from the group thought to be fast learners performed well, while rats from the other group performed poorly.

Administering Experimental Sounds to Animals

Headphones or stereo speakers are useful vehicles for exposing animals to the music tapes. For the experiments described here, we used a stereo tape player. If headphones had been used, it would have been important to position them at least an inch from the horse's ears.

We used a music tape developed by the composer to fit the tempo of fifty to seventy beats per minute with a regular rhythm: this rhythm has been found to promote relaxation and enhance learning and retention skills in humans. The Hemi-Sync signals were embedded under the music so that we human experimenters could not hear the difference between the control tape and the Hemi-Sync tape. The control and the experimental tapes were coded; the key to the codes was not given to me until after the experiment was completed.

In his theoretical perspective of the Hemi-Sync process, Atwater (1988) noted that the frequencies at which binaural beats can be detected change depending upon the size of the cranium, and that the distance between the ears influences how the brain perceives the signal. Horses, compared with humans, have much bigger heads and thicker skulls, but have much smaller brains (about the size of a grapefruit).

Administering Sounds to Horse Subjects

Our first experiments (reported here) were geared only to determining whether we could find conditions that would result in synchronizing the brains of horses. Each experiment session was forty-five minutes long.

Determining Whether Exposure to Hemi-Sync Synchronizes a Horse's Brain

All experiments were recorded on videotape, with the time and date marked on each frame and the sound track active. The subject horse was fitted with a battery-operated, simplified four-channel EEG HAL-4, modified so that it could (a) store the data on a buffer device, and (b) be turned on and off remotely. The entire equipment apparatus was packed into a plastic carrying case that was strapped to the horse where a saddle ordinarily would go. The electrodes were secured to a card affixed with Velcro to a horse bonnet. Electrical contact with the horse's head was assured for each electrode by first clipping the horse's forehead hair over the brain location and then coating the electrode contact sites with electrical conducting jelly. The electrodes were connected to the modified HAL-4 by cables.

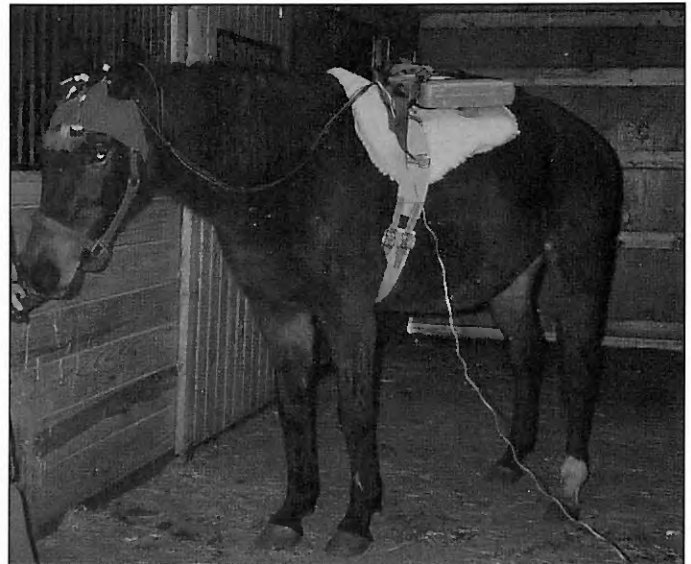
After the experiments were concluded, the data was downloaded from the buffer and stored on three-and-one-half-inch computer floppy disks for later analysis. Analysis consisted of using the HAL-4 software program to convert the EEG squiggles into an equivalent series of changing bar graphs by a mathematical process called fast Fourier transform (FFT). The bar graphs displayed a simultaneous graphic presentation of both the left and right sides of the horse's brain over the range of frequencies we monitored (four to twenty Hz) during the entire course of our experiment. This enabled us to observe whether stimulus with Hemi-Sync synchronized the brain of our horse.

Conclusion

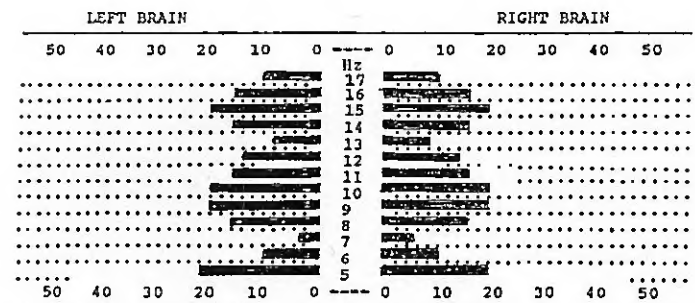
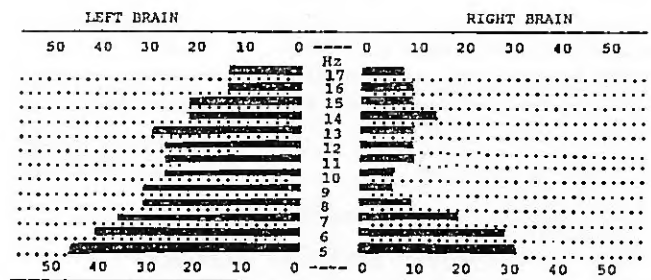
Reported here is the first evidence that the same types of Hemi-Sync that synchronize human brains can also synchronize horse brains.

This first horse study suggests several future uses for Hemi-Sync with equines, including (a) stress reduction during travel; (b) calming followed by attentiveness and alertness before races and horse shows; (c) enhancement of sleep and rest periods; (d) environmental enrichment in their quarters. Of course, the use of brain monitoring is ancillary to the important, visible behavioral effects of Hemi-Sync on humans and animals. However, such monitoring is a research tool that assists us in understanding the mechanism of the underlying events.

Under development now is BRAIN LINE 1, a battery-operated remote-controlled replacement for the modified HAL-4, which will capture EEGs in the frequency range of one to thirty Hz from four brain sites, store the EEGs, analyze brain output from each left and right pair independently, and fast Fourier transform the EEGs to bar graphs on a personal computer. The equipment will have the capacity of simultaneously following physiological processes, and will include a switch for operating a cassette player remotely.



Monitoring equipment was strapped to the subject horse's back with connecting cables to electrodes secured to the forehead.

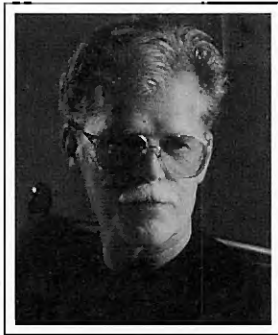


FFT bar graphs showing right- and left-brain activity before (above) and after (below) Hemi-Sync introduction.

THANK YOU

Please accept our deepest appreciation for your continuing generous support of The Monroe Institute. Your contributions allow us to move forward in our research, and expand the frontiers of human consciousness development for the benefit of our growing global community.

POSITIVE IMMUNITY PILOT PROGRAM: HEMI-SYNC AND AIDS



by James R. Greene

James Greene, CEO of Flashback Enterprises and educator, has twenty years of experience in the hair industry—product and distribution, advanced cosmetology instruction, and photostyling and fashion. His thirteen-year association with TMI began with the M-5000 Club. In addition to the Positive Immunity pilot program presented here, he is presently developing a program of Hemi-Sync for cosmetology schools.

On December 17, 1987, *USA Today* published a report on a study conducted by Mark Rider, a music therapist from Southern Methodist University, and Dr. Jeanne Acterberg of the University of Texas Health Science Center on the effects of creative visualization. A group of thirty volunteers listened periodically to a twenty-minute tape containing a relaxation message followed by music. They were asked to visualize specific types of blood cells being released in their bodies while listening to the tapes.

After six weeks, blood tests showed the only cell count that increased was the one they had visualized. While reading this report, it occurred to me that the combination of creative visualization and Hemi-Sync could aid in T-cell production for people who are infected with the human immunodeficiency virus (HIV).

I discussed with The Monroe Institute the possibility of creating a program which would be geared primarily to people diagnosed HIV-positive (the precursor to AIDS). With the Institute's support, and about two years of planning, the Positive Immunity (PI) pilot program was completed in the fall of 1989. The potential health benefits are extraordinary.

During the last ten years, while medical researchers have focused on developing an HIV-positive vaccine, not enough was being done on the psychological level. Instead of telling people to prepare themselves to die, rather, it seems appropriate to facilitate a positive attitude toward living. This new way of thinking can lead to a more productive and rewarding life, and possibly eliminate the virus.

PI is not restricted to HIV-positive persons. Indeed, the workshop can help those who are living with, or involved with, those who have tested positive or who have full-blown AIDS.

With a goal of tapping inner guidance and healing or strengthening the immune system, the program was developed to meet the mental, emotional, physical, sleep, and total self needs of the individual. Input from Bob Monroe about specific tapes helped us select the first seven tapes from the *GATEWAY EXPERIENCE* series: *Orientation* (Focus 3), *Introduction to Focus 10*, *Advanced Focus 10*, *Release and Recharge*, *Energy Bar Tool*, *Introduction to Living Body Map*, and *Free Flow Focus 12*. Copies of the Focus 12 Immunizing script, custom-written in 1990 by Robert Rosenthal, MD, are given to the

participants. This guided imagery journey through the body's cells is specifically designed to help increase the body's T-4, or helper, cells which are instrumental to the immune system's functioning.

Participation in PI has been limited to ten people per workshop and begins with an evening orientation and two tapes. The next day includes the remaining five tapes and discussion. A full two-day program is desirable when possible. Once the group has completed the first seven tapes, I recommend using *H-PLUS* tapes on an as-needed basis. (A weekly or semimonthly support group to introduce each tape was difficult to maintain, but the potential value and benefits of this type of group support are obvious.) The *H-PLUS* tapes include: *Relax*, *Let Go*, *Restorative Sleep*, *Regenerate*, *Contemplation*, *Immunizing*, *Sweet Dreams*, *De-Discomfort*, *Circulation*, and *Eight-Great*.

Bob Monroe's assistance in selection again proved to be extremely helpful. Numerous tapes in the *H-PLUS* catalog are useful because people who contract the virus may develop problems to which they are genetically predisposed. They can then structure a more individualized program for themselves.

The feedback on PI has been essentially upbeat. Some participants do not use the tapes after the workshop nor do they use Hemi-Sync tools. However, those who do experience very encouraging results. To our knowledge, the T-cells of at least three participants have increased. Reaching HIV-positive persons before their T-cell counts plunge to a low level, and before they develop opportunistic infections, seems to increase the chances of maintaining the integrity of the immune system and perhaps strengthening it.

The most difficult problem I have is determining exactly how beneficial the tapes are. A diagnosis of HIV-positive is almost always a life-and-death issue, making it virtually impossible to develop the participant's confidence to the extent that he or she is willing to use Hemi-Sync tapes and tools exclusive of other systems. All participants are under the care of at least one physician and are using numerous prescribed therapies. Thus, unless the facilitator is also the participant's physician or is working directly with his/her physician, it is unlikely that the efficacy of Hemi-Sync can be determined.

My hope is that the PI program will be expanded and facilitated by physicians or certified nonmedical professionals in association with physicians, which would enable us to compile more comprehensive data. Additionally, PI could become an adjunct therapy integrated with the primary healthcare services being received by the participant.

I believe that the correct *H-PLUS* tapes prescribed for the specific individuals in the early stages of immune system dysfunction can affect the longevity of afflicted people. Perhaps even more important, the quality of their lives can be improved through developing an understanding that they are more than their physical bodies.

"... [Positive Immunity] has played a significant role in my continuing state of overall well-being."

Perhaps the only way to evaluate PI honestly is to put the question to the participants and trust their judgment. The testimony of one of our original participants brings this message vividly to light.

"... What are the things I am doing to stay well? One major thing is using The Monroe Institute Hemi-Sync tapes. I find a combination of the *H-PLUS* and *GATEWAY* tapes to be optimal. I believe this is because the [*H-PLUS*] tapes work for me as a direct mind-to-body experience while the *GATEWAY* tapes provide me with spiritual nourishment. Jim Greene and Bob Monroe obviously recognized the benefits of both when they developed the Positive Immunity pilot project. Of the *H-PLUS* series, *Restorative Sleep* is my favorite. From the *GATEWAY* series, *One Month Patterning* is my tape of choice. All, however, have something to offer, and I believe each person who uses them regularly will develop a combination that works best for him or her. Initially I used one or two tapes every day at 4:00 PM. Now I listen

when I feel the need and don't have a regular schedule. The tape I use and the time is determined by my own sense of hunger. I do, however, keep the tapes handy at all times.

Although the tapes are excellent in and of themselves, I believe the most important thing I've gotten from them is the ability to go into Focus 10 and Focus 12 without them, and to put my "altered state" to good use. Recently, for example, while in the dentist's chair, I was able to close out pain using Focus 10. No tapes were involved; I merely used the technique.

What I hope I have just described is a process wherein the tapes are a support mechanism, playing a dominant training role in the beginning and a less frequent, but important, refresher role when one becomes familiar with the techniques.

Has the Positive Immunity project of The Monroe Institute saved me from sickness or death? No one can know that, but I do believe it has played a significant role in my continuing state of overall well-being."

[For more information on Positive Immunity, contact Jim Greene, 4011 South 7th Street, Arlington, VA 22204.]



HEMI-SYNC AND ARCHETYPE EMERGENCE IN JUNGIAN PSYCHOTHERAPY



by Laura A. Batchelor, MA

Laura Batchelor, an educational therapist practicing privately in St. Louis, Missouri, specializes in creative/vocational expression, spiritual development, Jungian theory, and transitions. She began introducing Hemi-Sync into her work with clients in 1990 as a tool for accelerating the therapeutic process. In this excerpt from her presentation, Ms. Batchelor discusses the impact of Hemi-Sync on archetype emergence. [Ed.: Also see HEMI-SYNC JOURNAL, Winter 1991, Vol. IX, No. 1.]

The clients I work with are ordinary people from all walks of life who have chosen to explore not only the social and cultural influences of their outer world, but the dynamics of their inner worlds, of their psyches. Within Jungian psychotherapy, this type of work is termed the "individuation process." Individuation occurs naturally and spontaneously within the psyche. The more aware one can be of his or her individuation process, the more one can begin to achieve a sense of wholeness. As a psychotherapist, I work with people who want to stretch their awareness beyond old ways of understanding—toward wholeness.

In this presentation I will discuss archetypal structure, my therapeutic methodology, and the influence of Hemi-Sync on archetypal emergence.

Archetypal Structure

Archetypal structures are instinctual behavioral patterns common to everyone—psychic processes transformed into and perceived as images. As we each have physical organs, so do we contain nonphysical psyche organs, or archetypes. There are four basic archetypal structures, termed by Carl Jung:

1. Animus. The conscious mind incorporating the masculine principle;
 2. Shadow. The unconscious mind, seat of emotion;
 3. Anima. The intuitive mind incorporating the feminine principle;
 4. Self. The universal mind incorporating the androgynous principle.
- The animus and the shadow archetypes reflect the five-sensory personality. They are the closest to, and pertain to, social and cultural influences. The anima and the self reflect the multisensory personality, which is aware beyond the five physical senses.

By observing and recording psychic imagery, particularly dreams, one is better able to understand the productive or nonproductive role that an archetypal structure plays within one's life. There are often considerable differences in the types of imagery experienced. Some are simple, impersonal, and myth-like in form, which usually springs from a deep stratum of the psyche, the collective unconscious. Here symbols are present only as structure, not yet filled with individual content. The collective unconscious pertains to humankind as a whole. When the imagery is elaborate and complex, its source is usually the personal unconscious, the stratum of the psyche which is filled with individual experience and content.

Identification of the archetypes in imagery provides valuable information on the current state of one's awareness or lack of awareness, individual needs which may be stifled or repressed by the conscious mind, and areas of conflict, nonconflict, and dysfunction. Archetypal imagery also indicates when the individuation process has reached the "midpoint," as Carl Jung called it. At this point, tremendous change begins to occur within a person. As the intuitive mind, or anima, provides more opportunities for growth and development, a kind of archetypal parenting of the mind begins. With the emergence of this parenting, or self-governing principle, comes a sense of the relationship of all things—the universal mind. To the conscious mind, or animus, the consequence of this emergence is an entirely different attitude. One is no longer a touchy, egotistical bundle of personal wishes, fears, hopes, and ambitions which must be compensated for with countertendencies. Instead, life becomes a function of relationship to the world at large, bringing the individual into absolute, binding, and indissoluble communion with the Universe.

Therapeutic Methodology

Most clients enter the therapeutic relationship without an awareness of internal imaging. To begin archetypal work I have the client record in a journal all emotional, memory, intuitive, and sensate material, including dreams, visions, and fantasies. We then work with this information to educate the client about how s/he processes internal data, to differentiate emotional from intuitive responses, to observe archetypal behavior, to foster understanding about how dysfunction on the five-sensory level can block emerging archetypes, and to encourage the client's individuating process.

The Influence of Hemi-Sync

I tend to introduce the Hemi-Sync tape, *The Way of Hemi-Sync*, into the individuation process when a reduction of stress and anxiety is called for. This tape is nonthreatening; it gives information and instruction simply and easily, guiding the listener through an autogenic exercise and into gentle stillness.

My experience with Hemi-Sync has shown me that it very effectively and gently accelerates processing within the psyche, first between the conscious and unconscious minds. Then, as the psychic environment is cleared of old internal conflict, the presence of the intuitive mind, or anima, begins to emerge quickly. When the

presence of the intuitive mind is recognized by the conscious mind, the intuitive mind is able to introduce the conscious mind to the most confronting archetype of all: the universal mind, or self.

Before I introduced Hemi-Sync as a therapeutic tool, most of my work with clients was on the personal, five-sensory level of consciousness. Since using Hemi-Sync to aid their individuation processes, all but my new clients work on the intuitive level, in the multisensory arena. With the lessening of the repression of the intuitive and

Since using Hemi-Sync . . . all but my new clients work on the intuitive level, in the multisensory arena.

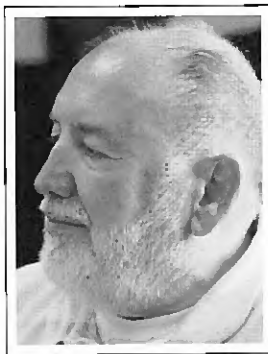
universal levels of consciousness, those engaged in the individuation process are now able, with their newly discovered multisensory personalities, to explore progressively farther reaches of the potentials of their physical and nonphysical beings. In the last three months many clients have expressed to me that dreams, never thought possible a year ago, are now coming true—thanks to much hard work and a new-found tool called Hemi-Sync.

As Jung said, and I feel, "Many of my cases are not suffering from any clinically definable neurosis, but more from the senselessness and aimlessness of their lives." As Jung suggested, this state of being seems to be a form of the universal neurosis of our time—a time in which fundamental values are dangerously wavering and a spiritual and psychic disorientation has taken hold. In view of this situation, I submit that the "way of individuation," as postulated by Jung, and the "way of Hemi-Sync," as offered by Monroe, are two excellent ideas, each informing the other of the possibilities of what is, and what can be, manifest in this world.

By activating the creative forces of Jung's archetypal world with the use of Hemi-Sync sound patterns, and consciously integrating them into the whole of the psyche, perhaps we can help complete the full flowering, not only of the individual, but of the group.



HEMI-SYNC USES IN MILITARY SETTINGS: EDUCATION AND COUNSELING



by

Raymond O. Waldkoetter, PhD

Ray Waldkoetter is a personnel management analyst performing developmental studies focusing on organizational efficiency and performance enhancement techniques for U.S. Army combat needs. He is also a private practice psychologist with an avocation in counseling and consulting in which psychic processes and intuitive guidance are used. In this presentation, Dr. Waldkoetter reviewed uses and investigations of Hemi-Sync by the Army since 1978.

Several intensive experiences in Army military training programs have demonstrated positive results using the Hemi-Sync technology. The instructional and therapeutic examples discussed are perhaps limited, yet give some notion of how Hemi-Sync can be adapted to enhance competent instruction and treatment. Training studies mentioned here were conducted under U.S. Army sanctions.

Audio-Guided Stress Reduction

The Hemi-Sync technology was identified to help support training during early 1982 by creating a relaxed yet attentive state. A plan was developed to evaluate the potential of the technology for stress reduction and the acceleration or enhancement of training performance.

The basic broadcasters course (BBC) for lower-ranked enlisted personnel of the Defense Information School (DINFOS) at Fort Harrison was selected as a plausible test unit. The broadcasters training involves conditions of time pressure and high skill requirements. Test students generally displayed a number of positive differences in stress reactions and performance responses over the stress control group and the course-performance control group.

Further study and use of Hemi-Sync were recommended in the area of accelerated training, although the 1982 evaluation was not wholly conclusive. Based on the evaluated student acceptance and DINFOS faculty observation, enlisted students can expect accelerated learning experiences through the awareness of relaxation, favorable changes in actual performance, or enhanced motivation. A more successful application of Hemi-Sync in a properly designed instruction program can occur if the evaluated tapes and performance measures are precisely adapted to support given training objectives. The training effectiveness of the technology, as evaluated, suggested that where enlisted student performance met or exceeded standards the technology can serve to induce relaxation and lessen the degree of task stress, i.e., less effort and more efficient work.

In adapting Hemi-Sync to the broadcasting course requirements, students and faculty suggested it as an alternative counseling strategy for rapid acquisition training when it cannot fully be incorporated into the regular schedule. If several students per class were retained with the help of this technology during one year, a tangible cost reduction would result.

Additional interest in Hemi-Sync applications was expressed in A U.S. Army Science Board Report (July 1983) dealing with future applications of training technology. Another application was reported earlier through Army military intelligence channels (March 1983).

BBC Student Counseling Activities

After the preceding work with the DINFOS BBC, several faculty members and administrative heads recognized the potential of Hemi-Sync-based materials as counseling support. Though the use of Hemi-Sync tapes was accepted in the school program, it was understood that each course could not have Hemi-Sync materials specifically prepared. Several tapes were seen to be useful in more than one academic setting, while others were restricted to the BBC coursework.

Students using Hemi-Sync in the BBC course followed directed tape use, while students seeking counseling were given minimal verbal direction. Most of the students were "recycles," or those repeating some part of the course, so did not need lengthy orientation. The counseled students readily acknowledged the tapes helped them sleep, study, prepare for class more efficiently, control nervousness, organize activities better, and retain more information.

Excepting the Audio-Guided Stress Reduction study, in which a relatively small number of students were observed, the counseling of a few students per class across eight years (1983 to 1990) has amounted to a sizable sample. Conservatively, the students benefiting from counseling number at least 180, probably closer to 200. Given the number of students advised by faculty and counseled to fulfill course requirements, the contribution of Hemi-Sync appears to have helped the students, both academically and emotionally, and protected the school's financial investment by graduating these 200 students during the last eight years.

A Language Training Venture

A language training program was introduced at a western U.S. Army site using an inventive blend of Hemi-Sync and the Georgi Lozanov language teaching method. Two female teachers began a language training program designed to bring refresher material to specially trained combat-oriented male soldiers. Classes were designed to move the students quickly from their own language capabilities to a higher, but common, level of group proficiency in the conversational use of the chosen language(s). Both teachers were excellent language instructors who used some appropriate text materials and unobtrusively presented the Hemi-Sync and music as a minor innovation.

Hoping to attain at least expected language proficiency, and to enhance the learning environment with the added sounds, the teachers observed that learning was changed in a subtle, but noticeable, way. As the students followed directions, the teachers became aware that the atmosphere was relaxing and the students were more spontaneous in their responses. Enthusiasm was evidenced as class schedules were met and assignments were quickly accomplished. The Hemi-Sync and music seemed to be creating an environment where the students could unconsciously concentrate better and with less tension. Students having completed the language training did not later report any operational difficulties during their many foreign and highly stressful assignments. In fact, they consider their language training as one of their most rewarding military experiences.

Auditory Guidance in Officer-Level Training

Another test unit was selected for analysis and evaluation. A Public Affairs Officer Course (PAOC) requiring complex behaviors was selected at the Defense Information School (DINFOS). The public affairs officers' training and job involve various pressures and skill demands across military community relations, public affairs communication and media, and broadcasting, and could be affected favorably by technology that reduces stress and enhances learning. This test was considered feasible by DINFOS in view of the uncomplicated

technology, lack of class schedule disruptions, and test objectives. Three objectives were evaluated using the Hemi-Sync *Progressive Accelerated Learning (PAL)* cassette album.

Positive behaviors associated with tape use were revealed in improved responses for instructional areas and task performances (which affected training exercise results) and performance reactions. Twenty-five percent of the students reported that they experienced unusual mental and/or physical changes during tape use. Although a statistically significant number did not report such experiences, it is significant that some students can experience unusual changes that are personally inspiring.

Throughout the study, numerous student discussions and comments were exchanged, suggesting a largely positive behavioral experience with Hemi-Sync. Students individually reported that they sensed the tapes gave them the ability to do more in less time, and to organize assignments more efficiently. No mention was ever made of tapes adding to the course's learning difficulty, but improved study effort and relaxation did seem to result. Because of the course and time demands, most of the students did not use all six tapes. Several tapes were largely rated as "not at all" helpful or "not at all" assisting study improvement. This may not indicate tapes were ineffective, rather, that the tapes were not used enough to evaluate them accurately, or that they did not help performance already at a superior level. Generally, attention and readiness to perform assigned tasks were described as more focused. Where a few students reported negative reactions, they were counteracted by revised tape use and alleviating personal psychophysical symptoms.

Where the tapes were satisfactorily applied with a range of success, those students with stated interest or need appeared to benefit most. Those who volunteered to resolve some curiosity may have profited only by an accidental foray into some aspect of altered consciousness. It is recommended that, when feasible, the tapes be used in a training context with added emphasis on counseling or self-development coaching to make individual and course training objectives fully complementary.



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